

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation "...at a frequency of 0.1 to 2 kHz...", and the claim also recites "...preferably from 1 to 1.8 kHz" which is the narrower statement of the range/limitation.

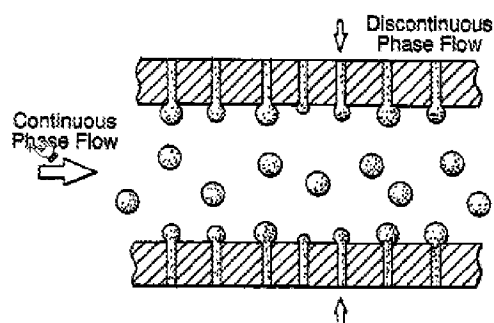
Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richard Williams (WO 01/45830 A1) in view of Duthion *et al.* (Pat. No. US 3,809,372).

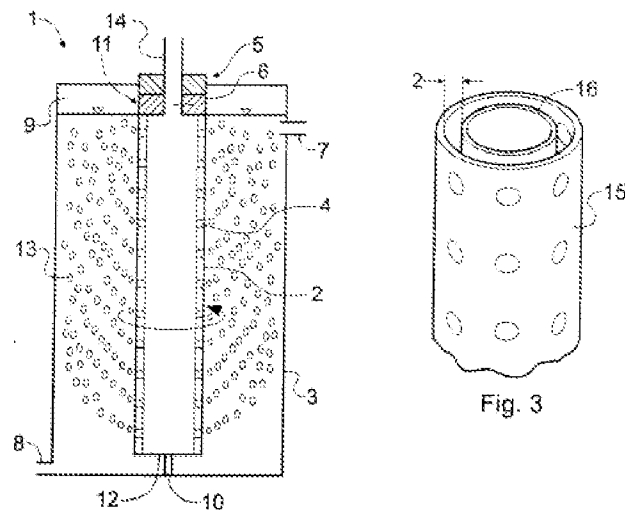
The applicants claim a method for preparing a dispersion of one fluid in another fluid by extruding one fluid, which is the dispersed phase, through a membrane orifice into another fluid which is the continuous phase, and wherein the extrusion is interrupted by a disturbance in flow of the continuous fluid characterized in that the disturbance is caused by a vibrating wire or plate which is placed at a distance of less than 1 mm from the membrane orifice through which the dispersed phase is extruded (Claim 1), wherein the wire or plate vibrates at a frequency of 0.1 to 2 kHz, preferably from 1 to 1.8 kHz (Claim 2), wherein the membrane orifice has a diameter of from 0.1 to 120 μm (Claim 3) wherein the disturbance in the flow or energy transfer is generated with microengineered electromechanical devices (Claim 4). The membrane is operated under cross flow of the continuous phase (Claim 5) and the method is used for the preparation of an oil and water containing emulsion (Claim 6).



Art Unit: 4171

5. Richard Williams (WO 01/45830 A1) discloses an apparatus comprising a reaction vessel for accommodating a first phase and housed therein there is provided at least one membrane for accommodating a second phase, the membrane adapted to rotate and upon rotation the second phase being controllably dispersed into the first phase, wherein the first phase is continuous and the second phase is discontinuous or wherein the first phase is discontinuous and the second phase is continuous. The reaction vessel is substantially circular in cross section and comprises a vat or pipe wherein the membrane comprises an elongate tube is provided with a plurality of pores passing radially through the material of the membrane and, is positioned so as to be coaxial with respect to the reaction vessel (Page 12- line 1-23). An example of the specific application of the technology using apparatus is in the dispersion of water into oil (Page 9, line 17-18). According to the embodiment of the apparatus, wherein the membrane is operated, the first phase is continuous and the second phase is discontinuous, alternatively the first phase is discontinuous and the second phase is continuous. The continuous phase may comprise a fluid such as a gas, liquid or emulsion and the discontinuous phase may comprise a fluid such as a gas, liquid or emulsion. The discontinuous phase, on contacting the continuous phase, may turn semi-solid or particulate by polymerization, precipitation or some other process (Page 3, line 27- 32) and wherein the disturbance in the flow or energy transfer is generated with microengineered electromechanical devices. However, Richard Williams's apparatus as shown below does not explicitly disclose the use of a vibrating wire or plate.

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Duthion *et al.* discloses device for generating ultrasonics in a fluid, comprising a membrane, two side plates located on each side of the membrane and each having at least one recess, said recesses forming adjacent opposing pairs, said membrane having at least a first discontinuity which forms a passage through which the fluid penetrates into the device and at least a second discontinuity extending the first discontinuity and forming a communication between each pair of said recesses located on each side of the membrane, each such second discontinuity leaving a substantial portion of said membrane extending between each respective pair of recesses sufficient to effectively vibrate (by means of achieving generating ultrasonic wave), and a conduit from one recess of each pair via which the fluid is evacuated from the device (Col 1, Claim 1, line 9-22).

Regarding the instant applicants' limitation claims 2 and 3 wherein the wire or plate vibrates at a frequency of 0.1 to 2 kHz, preferably from 1 to 1.8 kHz and wherein the membrane orifice has a diameter of from 0.1 to 120 μm , it's the examiner's position that these limitation are merely based on the apparatus optimization. It is the examiner's position that it would have been *prima facie* obvious to use the frequency of vibration Duthion's device for generating

Art Unit: 4171

ultrasonic waves between 10,000 and 25,000 cycles per second in Richard Williams's apparatus in combination with membrane orifice.

To provide the instant applicants' device in which the disturbance is caused by a vibrating wire or plate would have been obvious to one of ordinary skill in the art, in view of the teachings of Richard Williams and Duthion. Since all the claimed elements were known in the prior art, one skilled in the art could have combined the elements as claimed by known methods of the Duthion's device vibration for generating ultrasonic wave in Richard Williams' device with no change in their respective functions by serving the same purpose, thus the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention, i.e., one skilled in the art would have recognized that the use of vibration of ultrasonic wave can be easily incorporated into Williams' device to produce obvious result (see *KSR rationale – combining prior art elements according to known methods to yield predictable results*).

Examiner Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bijan Ahvazi whose telephone number is (571)270-3449. The examiner can normally be reached on M-F 8:0-5:0. (Off every other Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be

Art Unit: 4171

obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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